

WATER SUPPLY

ISSUES

Residents of Fairfax County receive public water service from one of three water agencies: Fairfax County Water Authority, City of Fairfax Department of Transit and Utilities, and the Falls Church Department of Public Utilities. (The Towns of Vienna and Herndon, while operating their own water distribution systems, purchase water from the City of Falls Church and the Fairfax County Water Authority, respectively. In terms of building major capital facilities to meet water supply needs, the towns are dependent on these two water agencies.) Using recent estimated averages, the Fairfax County Water Authority serves seventy-nine percent of Fairfax County residents, Falls Church serves thirteen percent, the City of Fairfax one percent, and the remaining seven percent of the residents receive water from their own individual wells.

While Fairfax County has neither direct administrative nor budgetary control over water suppliers, the importance of water facilities to County planning is recognized. The Board of Supervisors has entered into an agreement with the Fairfax County Water Authority which requires Board approval of all capital projects undertaken by the Water Authority. The Fairfax County Water Authority projects included in this CIP represent a program guided by the objectives of the Comprehensive Plan and endorsed by the Board of Supervisors. In the interest of providing a complete picture to the citizens of Fairfax County, the independent CIPs of Falls Church and Fairfax City are also presented. Inclusion in this document represents neither concurrence nor approval of Fairfax County of the individual projects proposed by Falls Church or Fairfax City. They are presented for information purposes only.

Fairfax County Water Authority

Sources of Water: Principal sources of water are the Occoquan Reservoir and the Potomac River. Supplementary sources of water include 2 public well systems and purchased water from the Cities of

Fairfax and Falls Church, Town of Vienna, Loudoun County, and Arlington County.

Occoquan: The Occoquan Reservoir is impounded by two gravity-type concrete dams across the Occoquan River, a few miles upstream of its confluence with the Potomac River. The low-level dam was constructed in 1950 and the high-level dam was constructed about 3,000 feet further upstream in 1957. The drainage area of the Occoquan River above the dam is approximately 595 square miles. The dam impounds about 8.5 billion gallons of water. The reservoir, when filled to the crest of the dam at Elevation 122, mean sea level, has a surface area of about 1,840 acres. The present Occoquan River supply has a safe yield of about 65 MGD (million gallons per day).

Potomac: The Potomac River Source of supply has its raw water intake located near Sugarland Run at Lowes Island in Loudoun County. The Potomac River at the Authority intake is not impounded.

The State of Maryland has jurisdiction over the withdrawal, appropriation and use of water from the Potomac River and regulates all users, including the Authority. The Authority has been issued a permit for an average Potomac withdrawal of 100 MGD and maximum withdrawal of 150 MGD. Increases in permitted withdrawals will be requested from time to time as needs require.

Treatment Facilities

Occoquan: Treatment of water is provided at three interconnected plants which have a combined certificated (Virginia Department of Health) peak capacity of 112 MGD. The Occoquan Treatment Plant, located on the south side of the River, was placed in service in 1964. The Lorton Treatment Plants, located on the north side of the River, were placed in service in 1951 and in 1973.

Facilities are available for applying various chemicals for coagulation, the control of taste and odors, fluoridation, and disinfection. The plants contain seven treated water reservoirs with total capacity of about 7.5 MG (million gallons). Water is pumped from those reservoirs to the transmission and distribution system.

One 24-inch, two 30-inch and three 36-inch diameter water mains transmit water from the treatment plants at Lorton and Occoquan to the distribution system, and to Prince William County.

Construction of the Griffith Treatment Plant will be initiated during 2000. The Griffith Treatment Plant will replace existing Lorton and Occoquan Treatment Plants.

Potomac: Construction of the intake structure, raw water pumping station and initial phase of the Corbalis Treatment Plant commenced in 1978 and was placed into operation in 1982. A major plant expansion was begun in 1992 and completed in 1995. The Corbalis Treatment Plant is authorized by the Virginia Department of Health to operate at a filtration rate of 150 MGD.

Facilities are available for applying various chemicals for coagulation, control of taste and odors, fluoridation, and disinfection. The plant contains two treated water reservoirs from which water is pumped to the transmission and distribution system. These reservoirs have a total storage capacity of 13.5 MG.

Several pipelines transmit water from the Corbalis Treatment Plant to the distribution system including one 48-inch diameter and one 30-inch diameter prestressed concrete pipelines, and one 54-inch diameter steel pipeline. A 36-inch diameter ductile iron pipeline is used to supply the Loudoun County Sanitation Authority.

Pumping Stations: Twenty-nine booster pumping stations are located within the distribution system to provide adequate pressure throughout the Authority's service area. These stations are normally unattended. While the smaller capacity stations operate automatically, the larger stations operate by remote control from the treatment plants.

System Storage: A total of 42 MG of distribution system storage is provided at 38 locations throughout Fairfax County. Principal facilities include 10 MG in two steel ground storage tanks at Fox Mill; 9 MG in three steel standpipes near Annandale; 7.5 MG in three steel ground storage tanks at Gum Springs; 6.7 MG in four steel standpipes and 2 MG in an elevated steel tank at Penderwood; 4.5 MG in two concrete

ground storage tanks at Tysons Corner; and 1 MG in an elevated steel tank at Fairfax Hospital.

Transmission and Distribution Facilities: There are approximately 2,902 miles of water main up to fifty-four inches in diameter in the system. The distribution system is interconnected at 76 locations with 12 other water systems in northern Virginia.

City of Fairfax Department of Transit and Utilities

Sources of Water: Fairfax City owns and maintains two water reservoirs in Loudoun County. They are two miles apart and are located about seven miles northwest of Sterling Park. Goose Creek Reservoir holds about 200 million gallons (MG). Beaverdam Creek Reservoir impounds about 1.3 billion gallons. Beaverdam Reservoir ensures the City a four-month supply against drought and low flow in Goose Creek.

Treatment Facilities: The City's treatment plant is located at Goose Creek; its capacity is twelve million gallons per day (MGD).

Pumping Stations: The City has a pumping station located at Goose Creek which delivers water to the transmission and distribution system.

System Storage: Three storage tanks (nine MG total) are maintained in the City to equalize water pressure.

Transmission Facilities: The City's water transmission line runs twenty-two miles from Goose Creek to the City of Fairfax along the abandoned W&OD railroad right-of-way and parallels Hunter Mill Road.

Falls Church Department of Public Utilities

Sources of Water: Falls Church buys treated water from the U.S. Corps of Engineers via a 36-inch connection to the Dalecarlia Filter Plant located on MacArthur Boulevard in the District of Columbia. The Corps obtains its raw water from the Potomac River at Great Falls.

Treatment Facilities: None.

System Capacity: The Falls Church Water System has a current system capacity of 30 MGD, with ultimate capability of 45 MGD.

Pumping Stations: The Falls Church Water System consists of the main pumping station at Chain Bridge and five booster pumping stations.

System Storage: The system includes nine storage facilities with a total capacity of approximately eleven MG.

Transmission and Distribution Facilities: The overall system consists of approximately 440 miles of pipe ranging from four inches to forty-two inches.

PROGRAM GOALS

The primary goal of the Water Supply program is :

- To provide the facilities to treat, transmit, and distribute a safe and adequate potable water supply.

RECENT PROGRAM ACTIVITY

The development of major capital improvements continues for the Authority's supply, treatment, transmission, and distribution facilities. Construction of the new F.P. Griffith Water Treatment Plant will begin this year. This proposed facility will provide state-of-the-art water treatment, replacing the out-dated Lorton/Occoquan facilities, and ensuring compliance with all provisions of the Safe Drinking Water Act. The Authority has obtained a site for the new treatment plant on land formerly occupied by the District of Columbia Department of Corrections Medium Security Prison at Lorton. Demolition of the prison buildings and infrastructure is complete. Upgrades at the Potomac's Corbalis Water Treatment Plant include construction of ozonation facilities and installation of additional finished water pumps. Major improvements to increase reliability at the Authority's Potomac Raw Water Pumping Facilities are underway. Construction on a new

54-inch diameter main from the Corbalis Water Treatment Plant to the Authority's Fox Mill Storage & Pumping Facilities has begun. Several additional transmission mains, including sections of the Fox Mill-Vale Road Water Main and the High Service No. 3 Replacement, are scheduled to be under construction later this year to improve service throughout the County. Design has begun on a Supervisory Control and Data Acquisition (SCADA) system to improve overall transmission operations. Various watershed management initiatives to protect source water quality are expected to continue in 2000.

CURRENT PROGRAM SUMMARY

The Water Supply element includes projects of the Fairfax County Water Authority (12 projects) the Falls Church Department of Public Utilities (8 projects). Total funding is \$539.91 million, all from systems revenues and revenue bonds. No new projects are anticipated by the City of Fairfax.

PROJECT DESCRIPTIONS

Fairfax County Water Authority

1. **Potomac Stage II Treatment Plant Additions.** \$9,005,000 (estimated total project cost for FY2000-FY2008) for construction of ozonation facilities and the installation of an additional finished water pump.
2. **General and Administrative Projects.** \$800,000 (estimated total project cost for FY2000-FY2008) for annual expenses attributed to administration and overhead, including salaried, fringe benefits and other expenses related to the implementation of the Capital Improvement Program and not otherwise directly charged to specific projects/activities within the program.
3. **General and Administrative.** \$29,800,000 (estimated total project cost for FY2001-FY2008) for annual expenses attributed to administration and overhead, including salaries, fringe benefits and other expenses.

4. **Subdivision & Other Development Projects.** \$6,520,000 (estimated total project cost for FY2001-FY2008) for annual expenses attributed to the review and approval of plans for water main installation associated with land development activities. This project also includes provisions for FCWA inspection of water mains installed by land contractors.
5. **Extraordinary Maintenance and Repairs.** \$40,023,000 (estimated total project cost for FY2001-FY2008) for ongoing and anticipated projects related to the extraordinary maintenance and repair of facilities related to supply, treatment, transmission and distribution systems, and general plant.
6. **Additions and Extensions and Betterments.** \$50,299,000 (estimated total project cost for FY2001-FY2008) for ongoing and anticipated projects related to the improvement and betterment of supply, treatment, transmission and distribution systems, and general plant features.
7. **General Studies and Programs.** \$8,183,000 (estimated total project cost for FY2001-FY2008) for general studies, programs, engineering and research pertaining to water quality, water supply evaluation and system component evaluation.
8. **Supply Facilities.** \$19,292,000 (estimated total project cost) for construction of an offshore intake and an additional raw water conduit. Costs also include various improvements to enhance the reliability of the Potomac Raw Water Pumping Station.
9. **Treatment Facilities.** \$219,077,000 (estimated total project cost) for the future Griffith Water Treatment Plant on the Occoquan Reservoir. Costs also include various improvements to the Corbalis Water Treatment Plant on the Potomac River.
10. **Transmission Facilities.** \$97,031,000 (estimated total project cost) for the design and construction of various transmission facilities throughout Fairfax County.
11. **Distribution Facilities.** \$2,078,000 (estimated total project cost) for the design and construction of additional distribution

facilities to replace failing well systems in eastern Fairfax County.

12. **General Plant Facilities.** \$41,745,000 (estimated total project cost) for the expansion of the Authority's office building and other expenses not directly chargeable to a specific project but are related to the implementation of the Capital Improvement Program.

Falls Church Department of Public Utilities

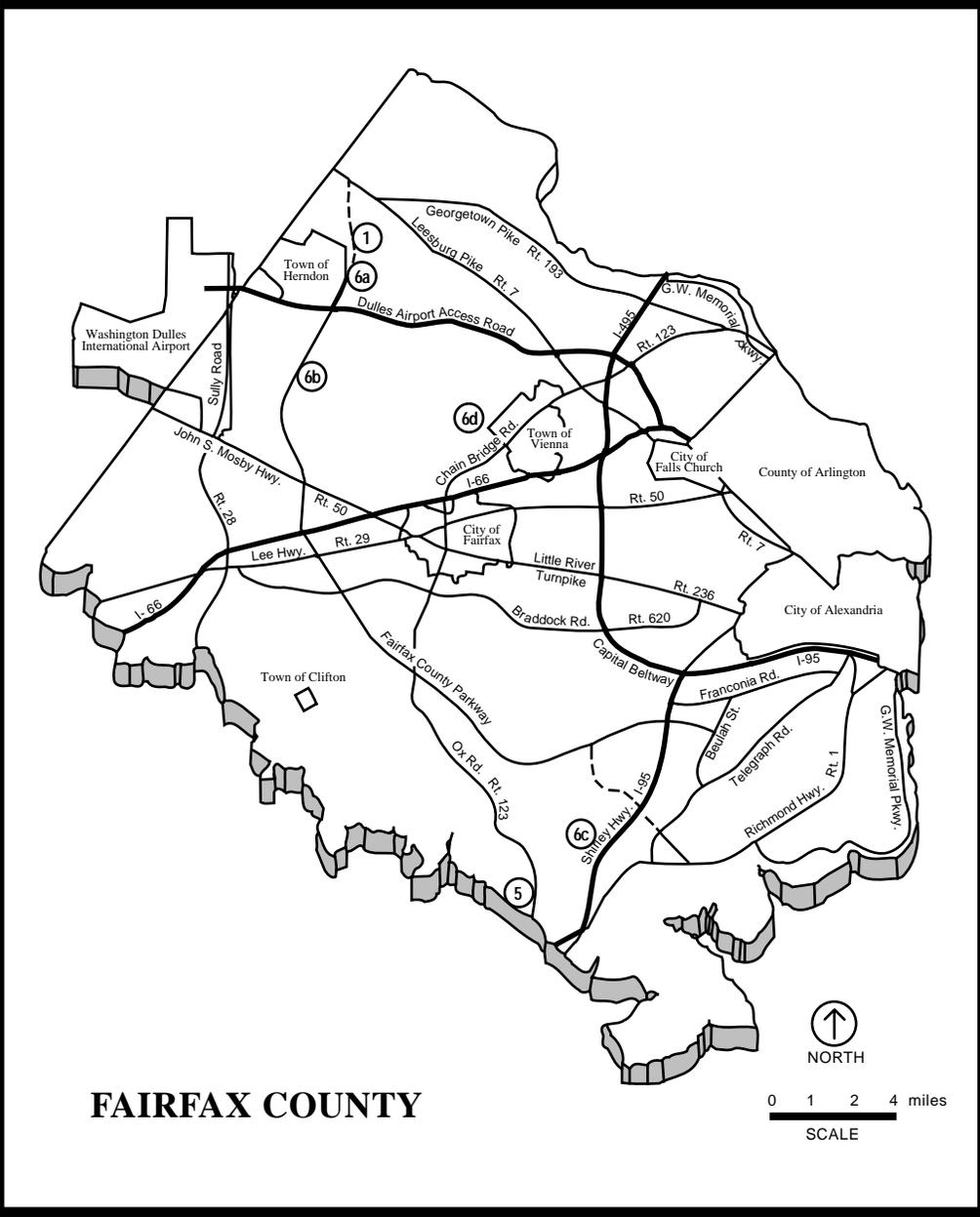
1. **Powhatan Street Water Main.** \$300,000 to install approximately 2,100' of 12 inch ductile iron pipe to interconnect with Arlington County water system and to provide emergency backup supply of water to the Chesterbrook 4th level including the City during failures or major water breaks.
2. **Land Acquisition.** \$2,775,000 for the purchase of land throughout the distribution system for new facilities or easements on an as needed basis.
3. **Dolley Madison.** \$1,000,000 for improvements to the Dolley Madison area network in the form of either new parallel 24 inch transmission main along Dolley Madison Boulevard or acquisition of existing Langley System.
4. **Property Yard Building.** \$1,287,000 for improvements to the Property Yard Site.
5. **Tysons Corner System Improvement.** \$6,000,000 to improve marginal pressure for the Tyson's service area and to provide additional storage volume (1.5 million gallons) for fire protection and domestic service to Tyson/Dunn Loring service area.
6. **River Crossing Inspection/Report.** \$500,000 to conduct inspections and assess and report the condition of the existing supply main from the Dalecarlia treatment plant to Chain Bridge pumping station, including the Potomac River crossing.

7. **Seven Corners System Improvement.** \$3,000,000 to install 11,000 LF of 12 inch to improve fire flow deficiencies.
8. **McLean Pumping Station Improvement.** \$1,200,000 to increase pumping capacity and reliability of pumping station, part of Tyson's System Improvement.

Water Supply

(Fairfax County Water Authority Projects)

- 1. Potomac Treatment Plant Additions
- 5. Treatment Facilities - F. P. Griffith Water Treatment Plant
- 6. Transmission Facilities -
 - 6a. Corbalis - Fox Mill Water Main
 - 6b. Fox Mill - Vale Road Water Main
 - 6c. High Service No. 3 Replacement
 - 6d. Hunter Mill Road Water Main



FAIRFAX COUNTY



NORTH

0 1 2 4 miles
SCALE

**PROJECT COST SUMMARIES
FAIRFAX COUNTY WATER AUTHORITY
(\$000's)**

PROJECT TITLE (FUNDING SOURCE)/1	TOTAL PROJECT COST	PROPOSED CIP TOTAL	AUTHORIZED/ EXPENDED/ THRU FY2000/2	FY2001	FY2002	FY2003	FY2004	FY2005	TOTAL FY2001-FY2005	TOTAL FY2006-FY2008	TOTAL FY2001-FY2008	ADDITIONAL NEEDED
Current Bond Projects												
<u>Treatment Facilities</u>												
1. Potomac Stage II Treatment Plant Additions	9,005	9,005	6,733 /3	1,922	150	150	50		2,272		2,272	
SUBTOTAL	\$9,005	\$9,005	\$6,733 /3	\$1,922	\$150	\$150	\$50		\$2,272		\$2,272	
<u>General Plant Facilities</u>												
2. General & Admin	800	800	600	150	10	20	20		200		200	
SUBTOTAL	800	800	\$600	150	10	20	20		200		200	
TOTAL REVENUE BONDS	\$9,805	\$9,805	\$7,333	\$2,072	\$160	\$170	\$70		\$2,472		\$2,472	
Net Revenue Projects												
3. General and Administrative	29,800	12,660	/4	1,730	1,530	1,700	4,100	3,600	12,660	17,140	29,800	
4. Subdivision and Other Development Projects	6,520	4,000	/4	780	790	800	810	820	4,000	2,520	6,520	
5. Extraordinary Maintenance and Repairs	40,023	27,097	/4	7,176	6,293	5,066	4,237	4,325	27,097	12,926	40,023	
6. Additions, Extensions and Betterments	50,299	31,989	/4	8,480	5,813	5,819	5,864	6,013	31,989	18,310	50,299	
7. General Studies & Programs	8,183	5,526	/4	1,739	1,246	837	856	848	5,526	2,657	8,183	
TOTAL NET REVENUE	\$134,825	\$81,272		\$19,905	\$15,672	\$14,222	\$15,867	\$15,606	\$81,272	\$53,553	\$134,825	
Future Bond Issue												
8. Supply Facilities	19,292	19,292	5,425	11,183	2,684				13,867		13,867	
9. Treatment Facilities	219,077	216,427	53,614	45,795	62,931	50,762	3,325		162,813	1,000	163,813	1,650
10. Transmission Facilities	97,031	70,552	19,804	14,950	7,350	3,500	8,500	16,448	50,748	21,429	72,177	5,050
11. Distribution Facilities	2,078	2,078	178	100	900	900			1,900		1,900	
12. General Plant Facilities	41,745	31,335	5,445	5,470	6,010	6,030	3,830	4,550	25,890	\$8,510	34,400	1,900
TOTAL FUTURE BONDS	\$379,223	\$339,684	\$84,466	\$77,498	\$79,875	\$61,192	\$15,655	\$20,998	\$255,218	\$30,939	\$286,157	\$8,600
GRAND TOTAL	\$523,853	\$430,761	\$91,799	\$99,475	\$95,707	\$75,584	\$31,592	\$36,604	\$338,962	\$84,492	\$423,454	\$8,600

FALLS CHURCH DEPARTMENT OF PUBLIC UTILITIES

8 Water Projects/5	\$16,062	\$16,062		\$12,262	\$1,300	\$500	\$500	\$1,500	\$16,062		\$16,062	
--------------------	----------	----------	--	----------	---------	-------	-------	---------	----------	--	----------	--

/1 Projects 1 & 2 are funded from Revenue Bonds; Projects 3 thru 12 are funded by net revenues. City of Falls Church projects are funded with system revenues.

/2 Prior expenditures include cost estimates through December 31, 1999.

/3 Includes FY 2000 expenditure only

/4 This is a continuing project. Prior expenditure is not provided.

/5 See project descriptions in the Water Supply section narrative.